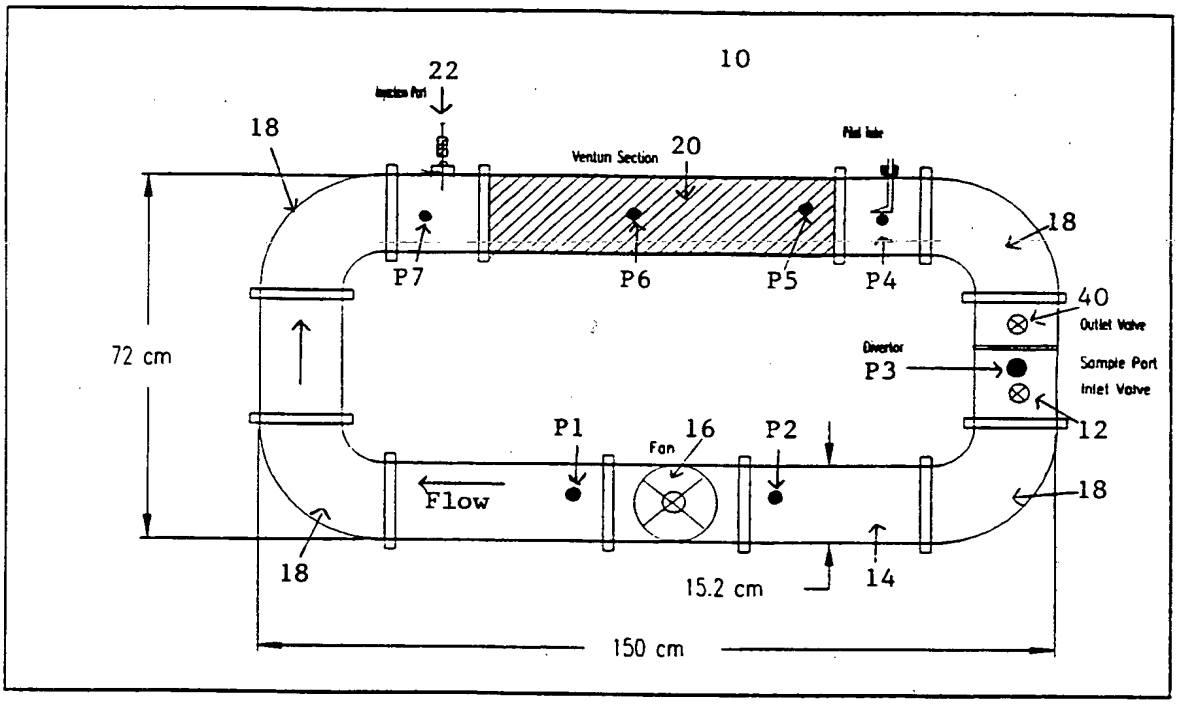

Figure 1 : **Schematic representation of Photo-CREC-Air and its associated internal components.**

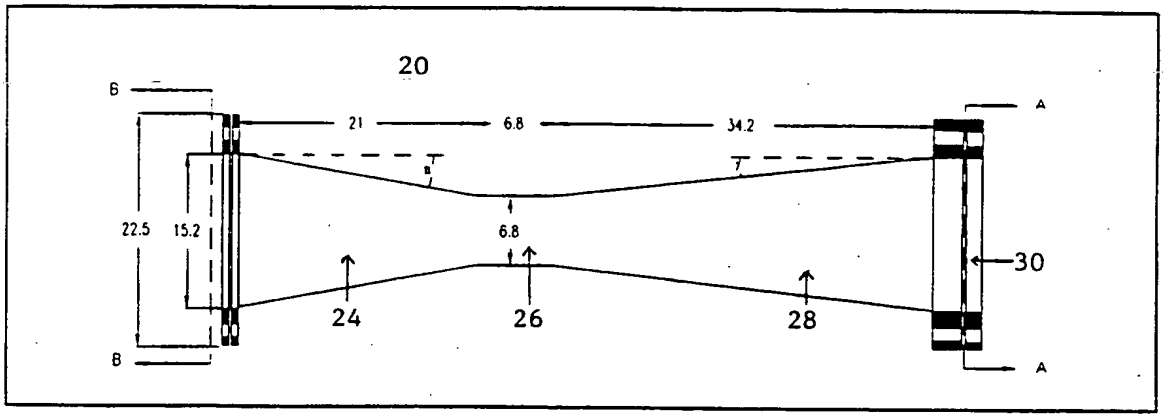

Figure 2 : **Schematic representation of the Venturi section.**

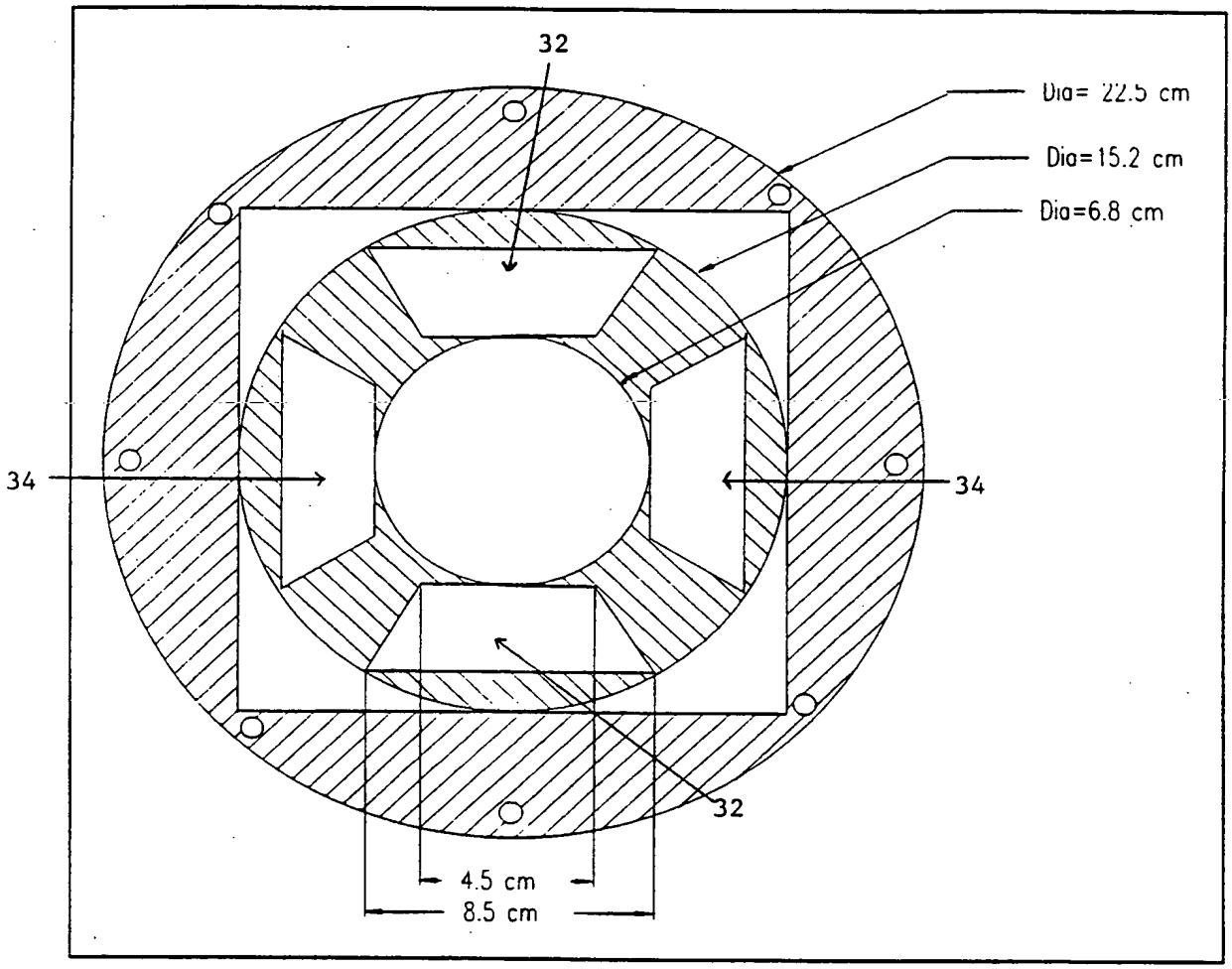

Figure 3 : **Cross section of the Venturi, section A-A.**

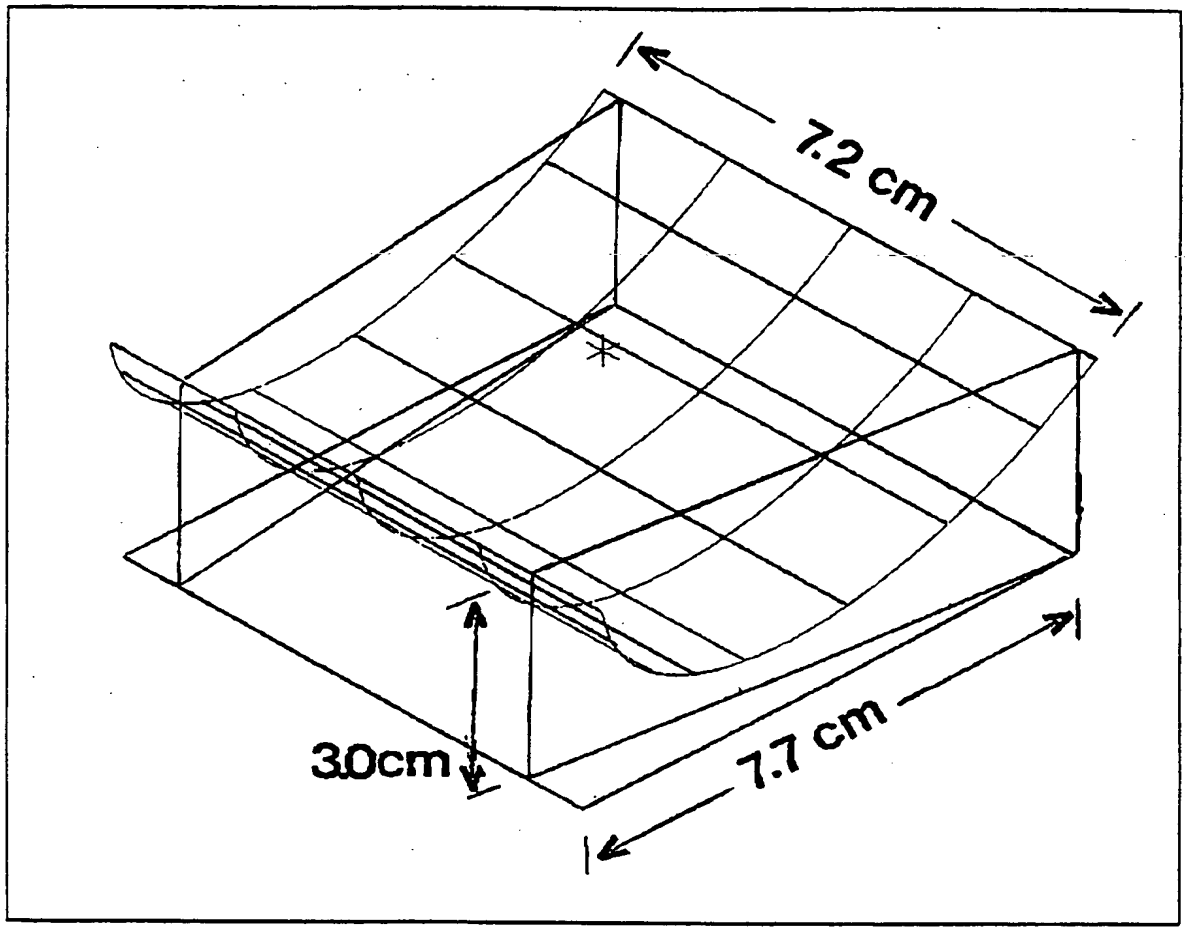

Figure 4 : **Details of Photo-CREC-Air reflector.**

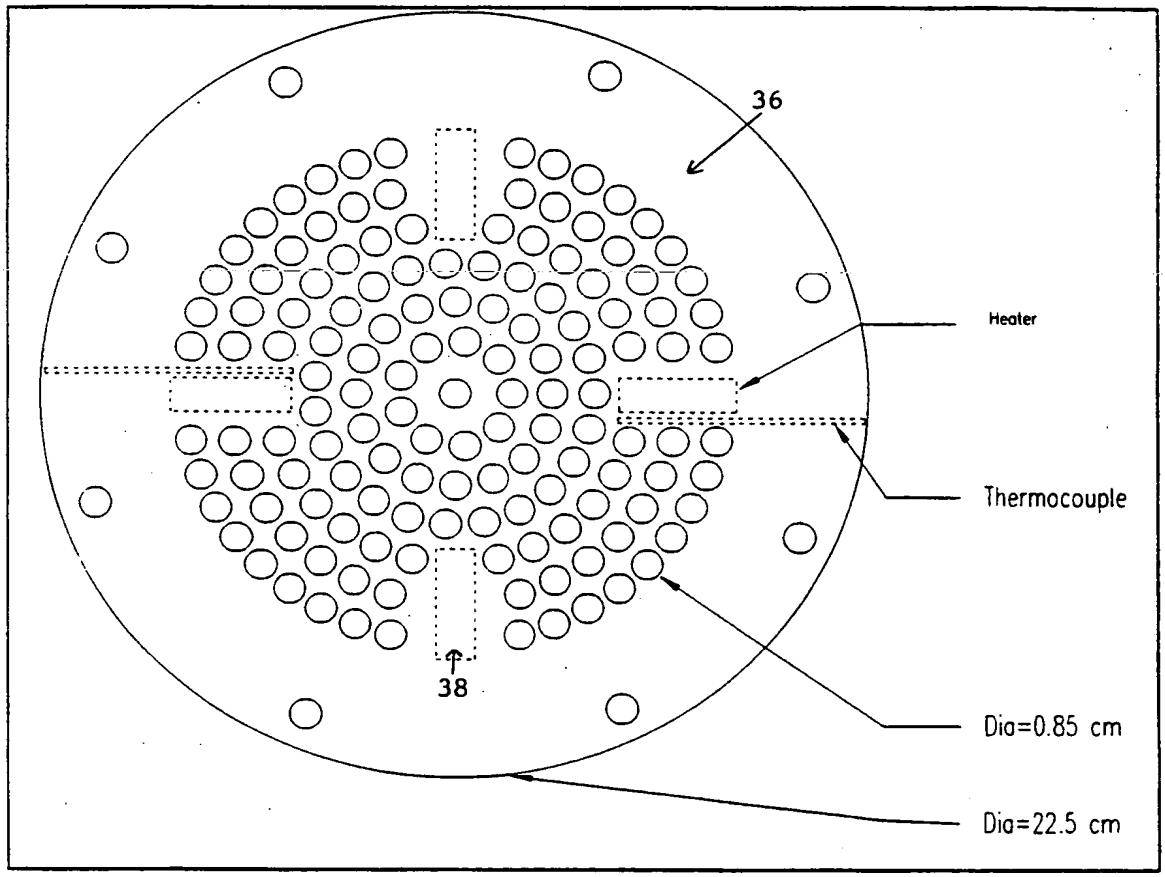

Figure 5 : **Mechanical drawing of the perforated plate.**

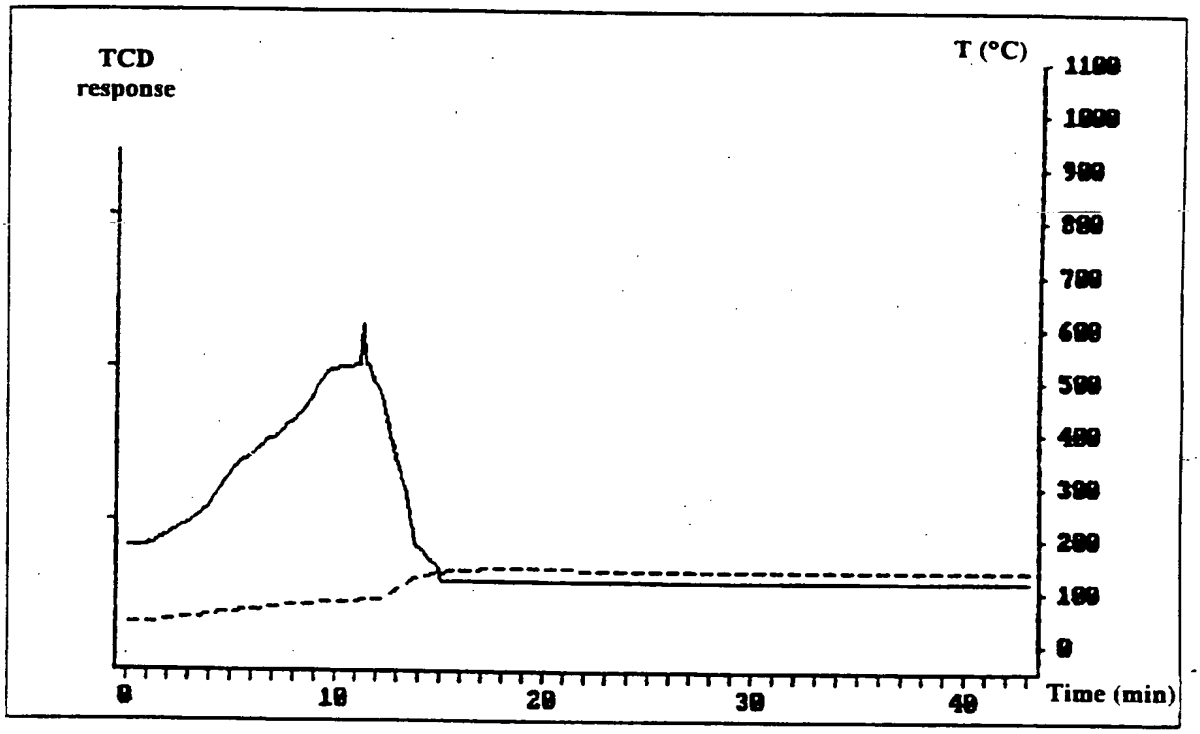

Figure 6: TPD of the 3M Blue Pleated Filter. The full line represents the water desorption from the mesh. The dashed line is the adopted temperature program.

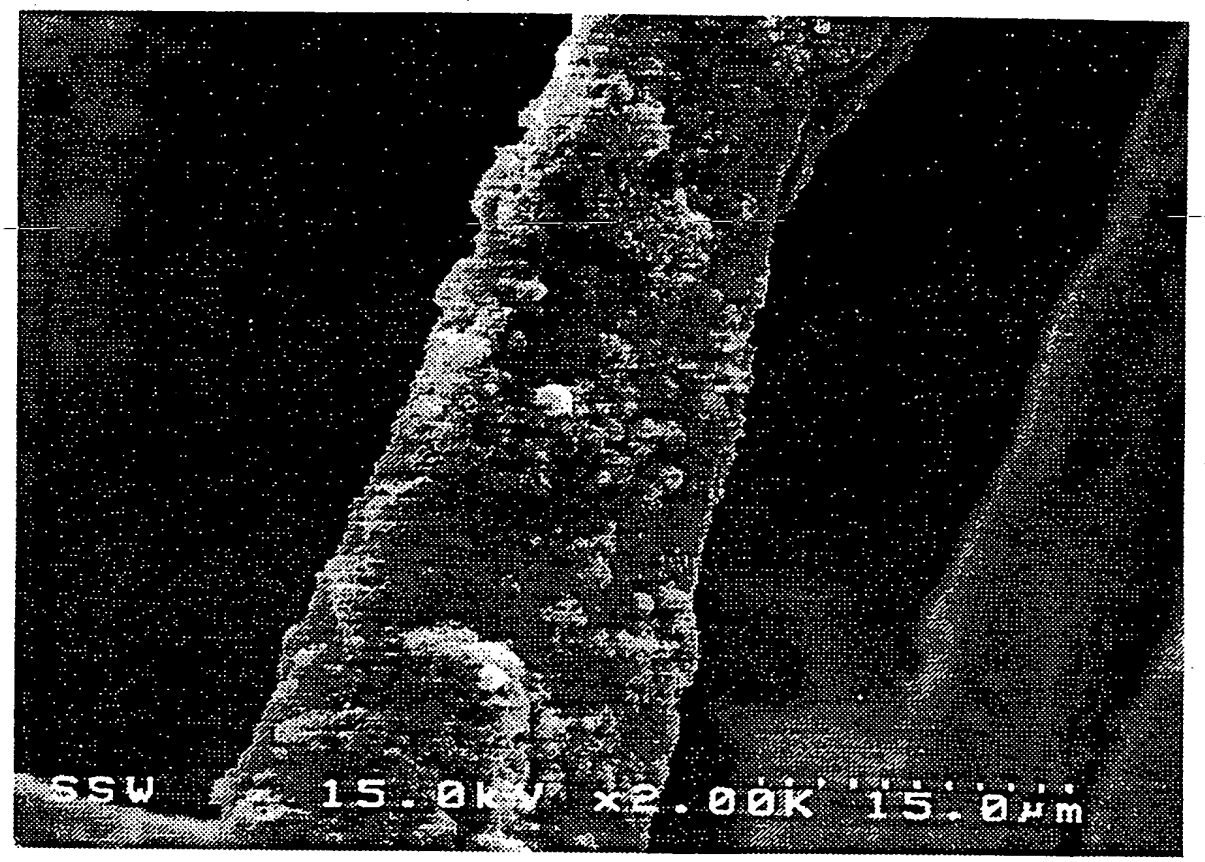

Figure 7 : Close up picture of Figure 5.5 showing a single treated strand and TiO_2 attached to it firmly.

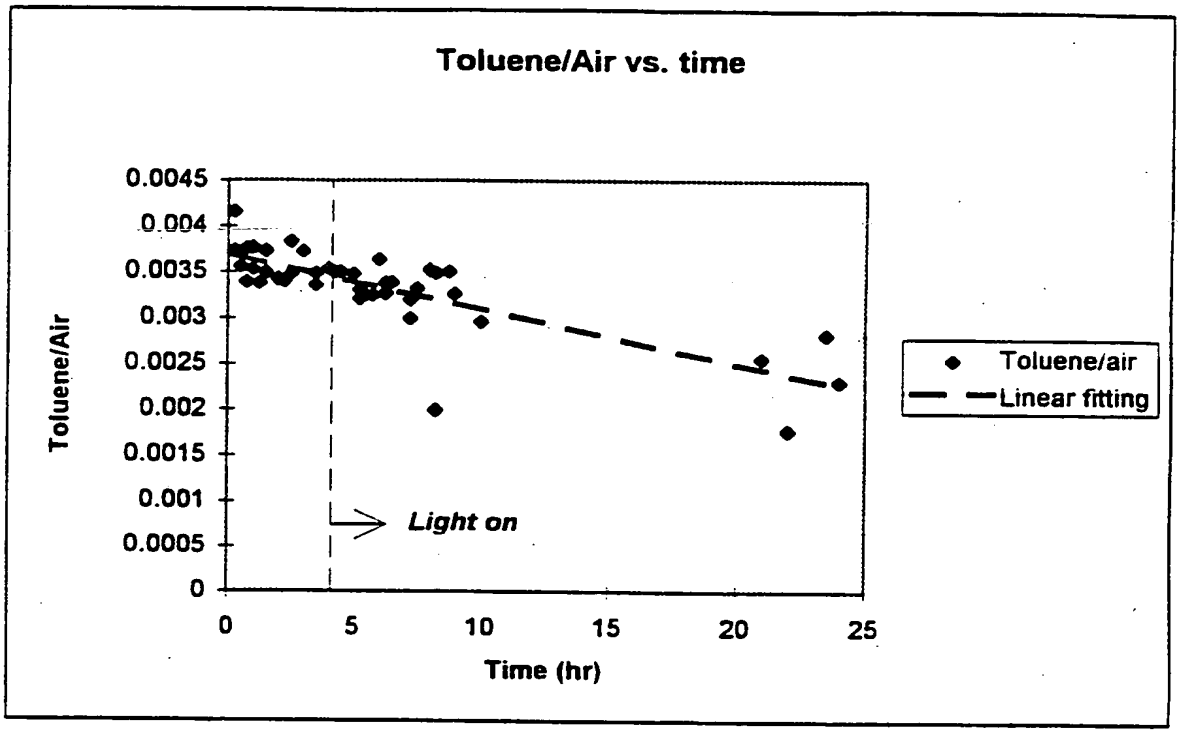

Figure 8 : Toluene/air ratio versus time, the internal standard used in the experimental runs.

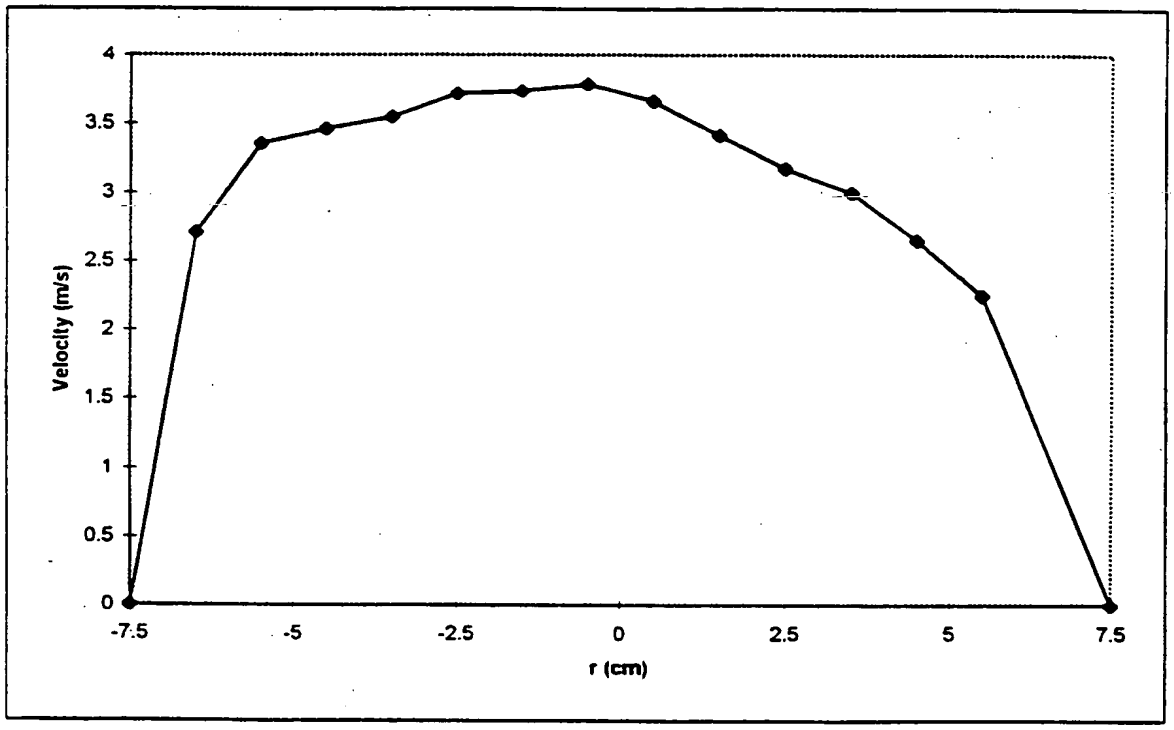

Figure 9A : **Velocity profile at 25 °C. Average superficial velocity to 2.83 m/s.**

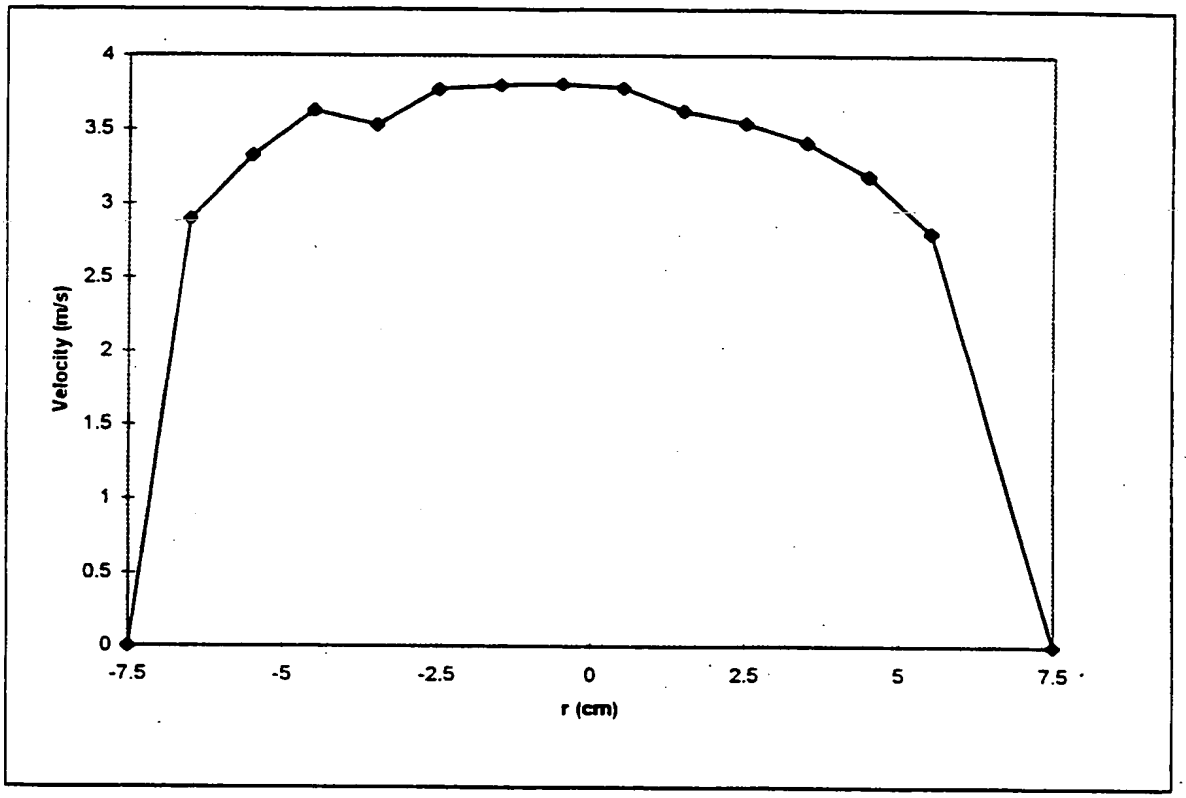

Figure 9B : Average velocity profile at 97°C. Average superficial gas velocity 3.0= m/s.

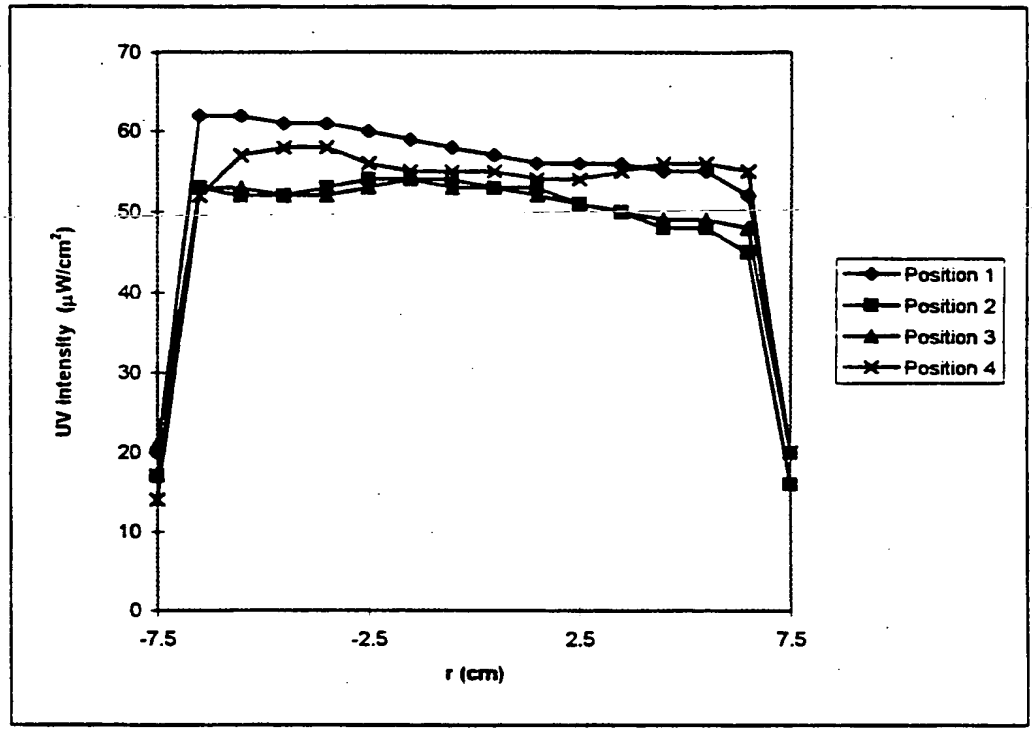

Figure 10A UV intensity profile across the filter sectional area with r=0 representing the center of the filter. Position 1: 0 degrees, Position 2: 90 degrees, Position 3 :180 degrees, Position 4: 270 degrees.

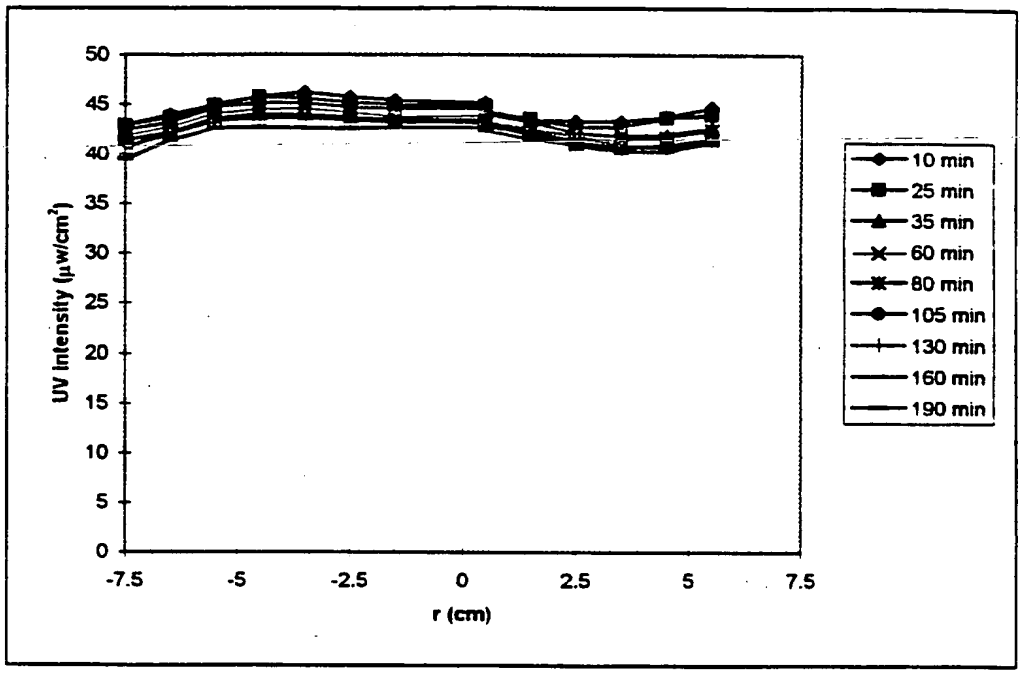

Figure 10B : Radial UV intensity decay profile across the mesh with r=0 representing the center of the mesh.

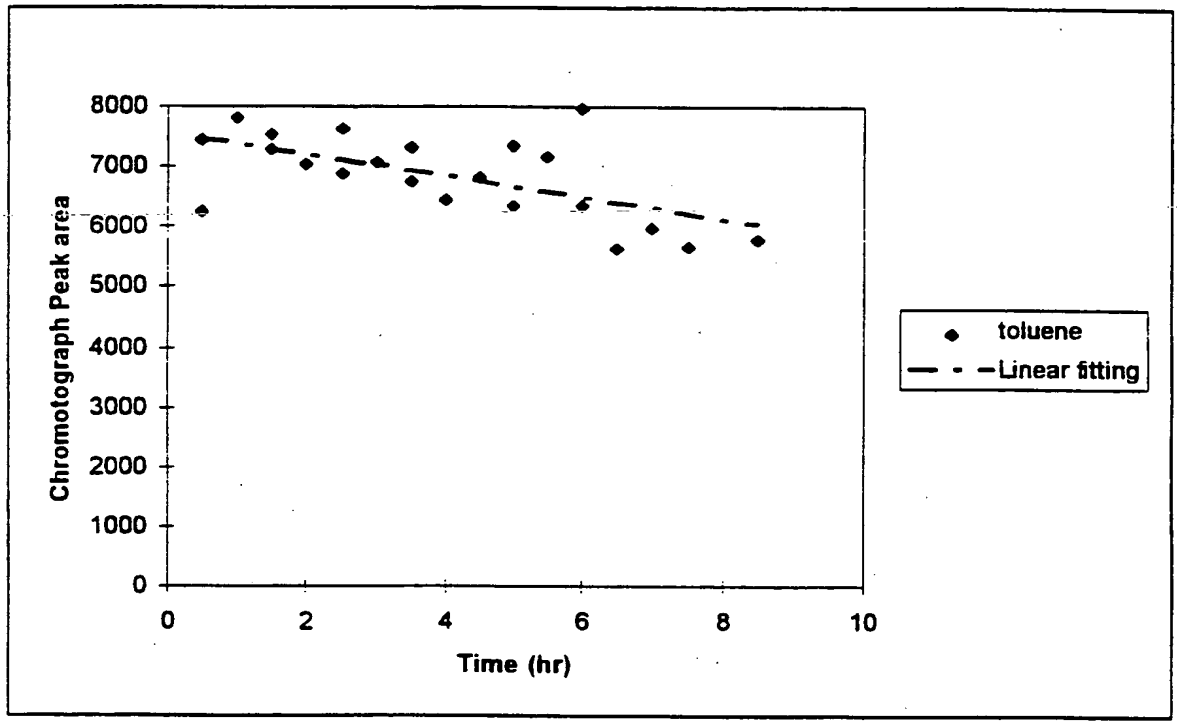

Figure 11A : **Results of the blank runs in Photo-CREC-Air lacking TiO_2 mesh and with no UV irradiation at 20°C.**

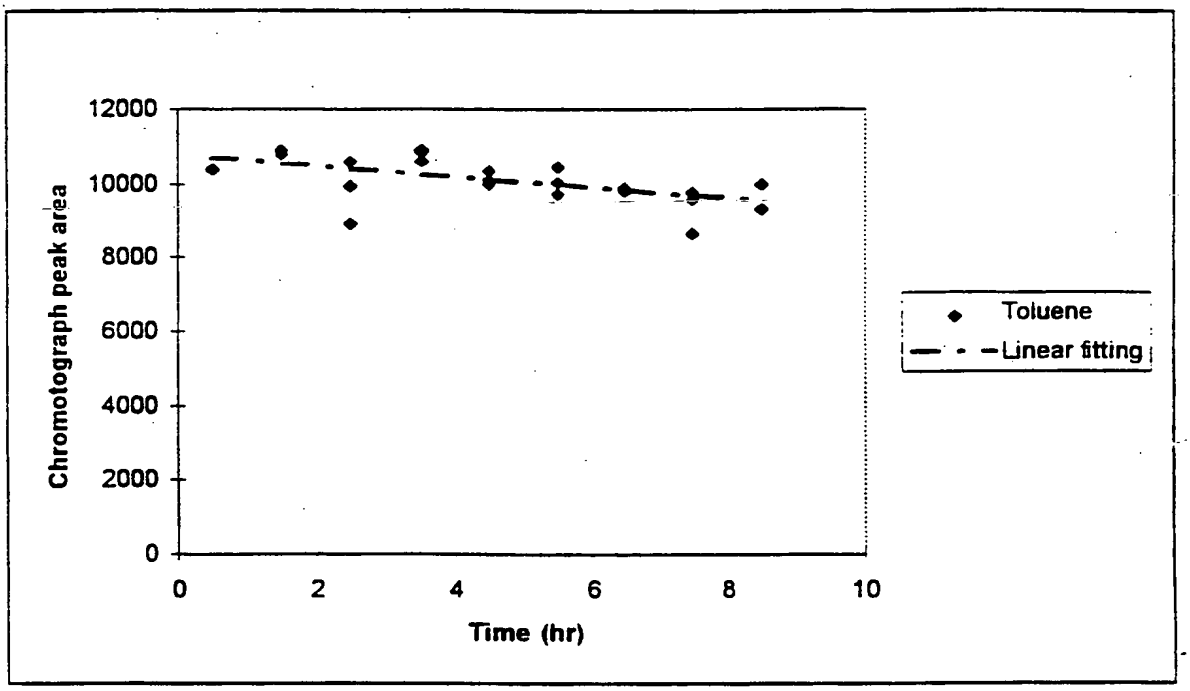

Figure 11B. **Results of the blank runs in Photo-CREC-Air lacking TiO_2 mesh and with no UV irradiation at 100°C.**

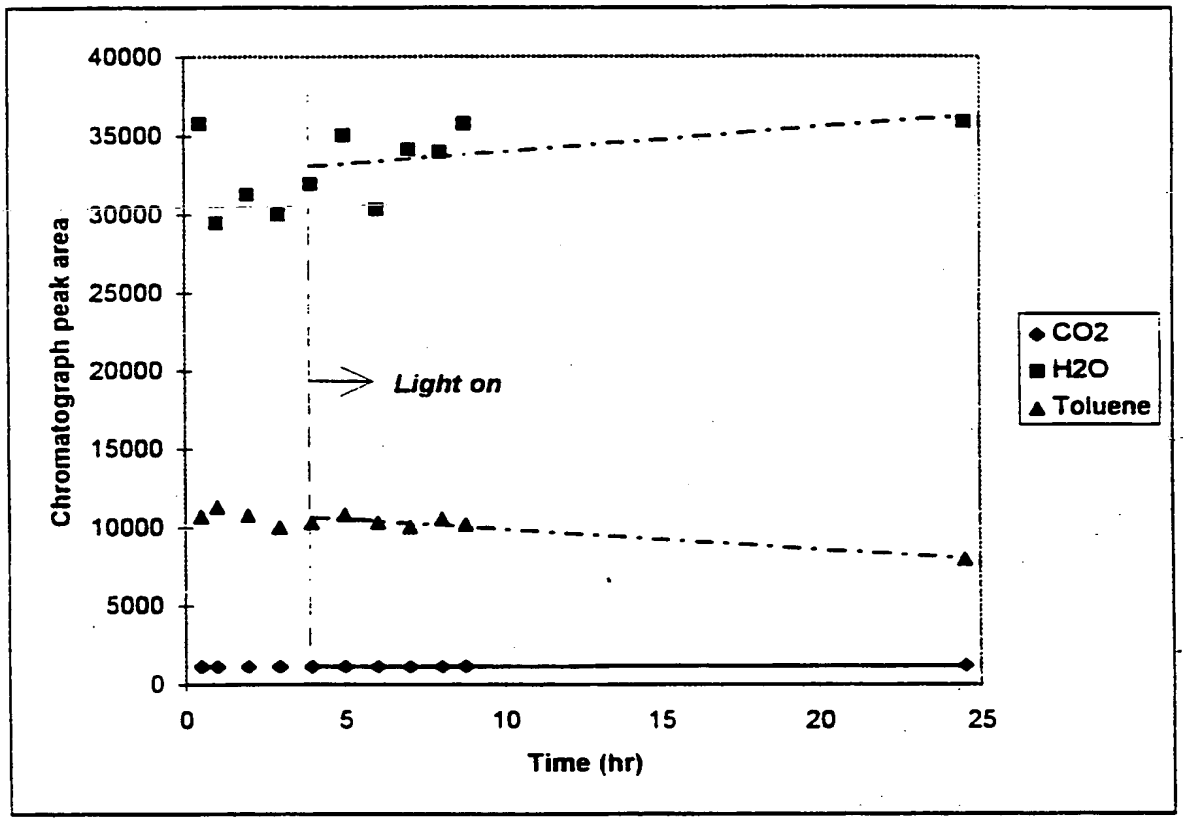

Figure 12 : **Typical experimental curves showing changes of reactant and product concentration as a function of time-on-stream with toluene concentration being 10.4 μg/cm^3 and heating plate at T=100°C.**

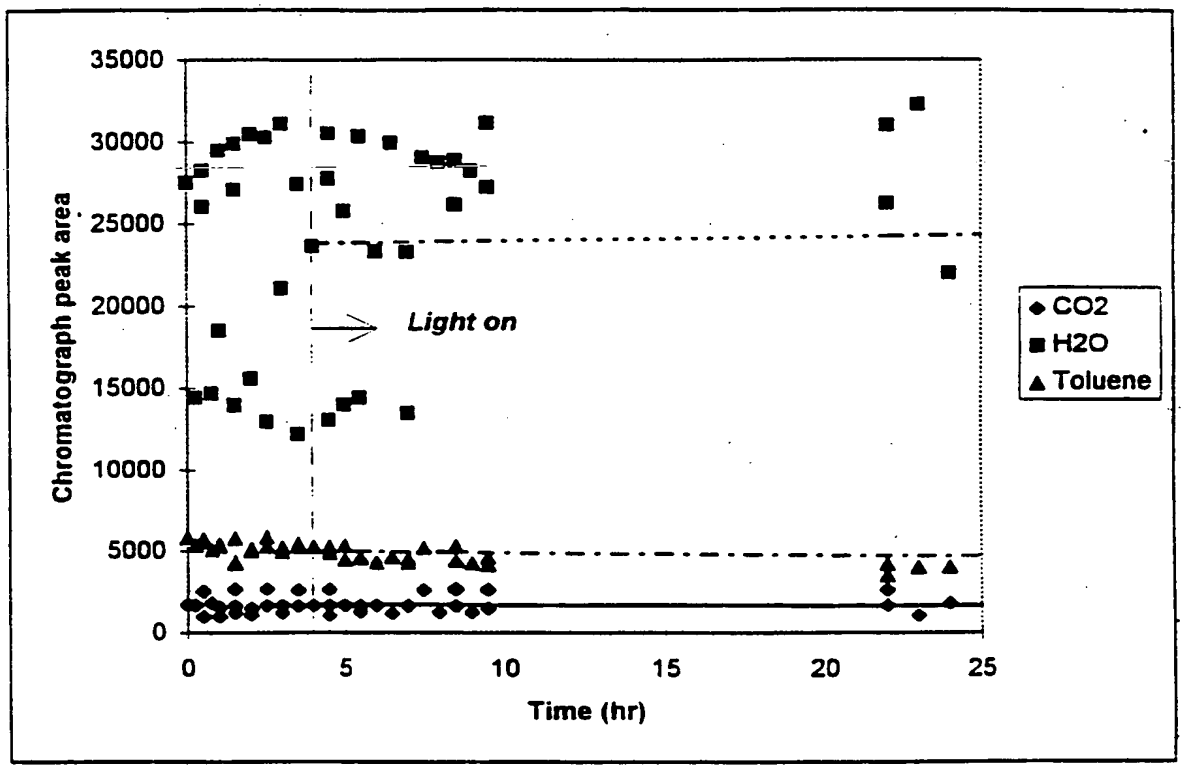

Figure 13A : **Experimental run with Photo-CREC-Air: initial toluene concentration=5.2 μg/cm^3, Temperature=100 °C, water level below 25 μg/cm^3.**

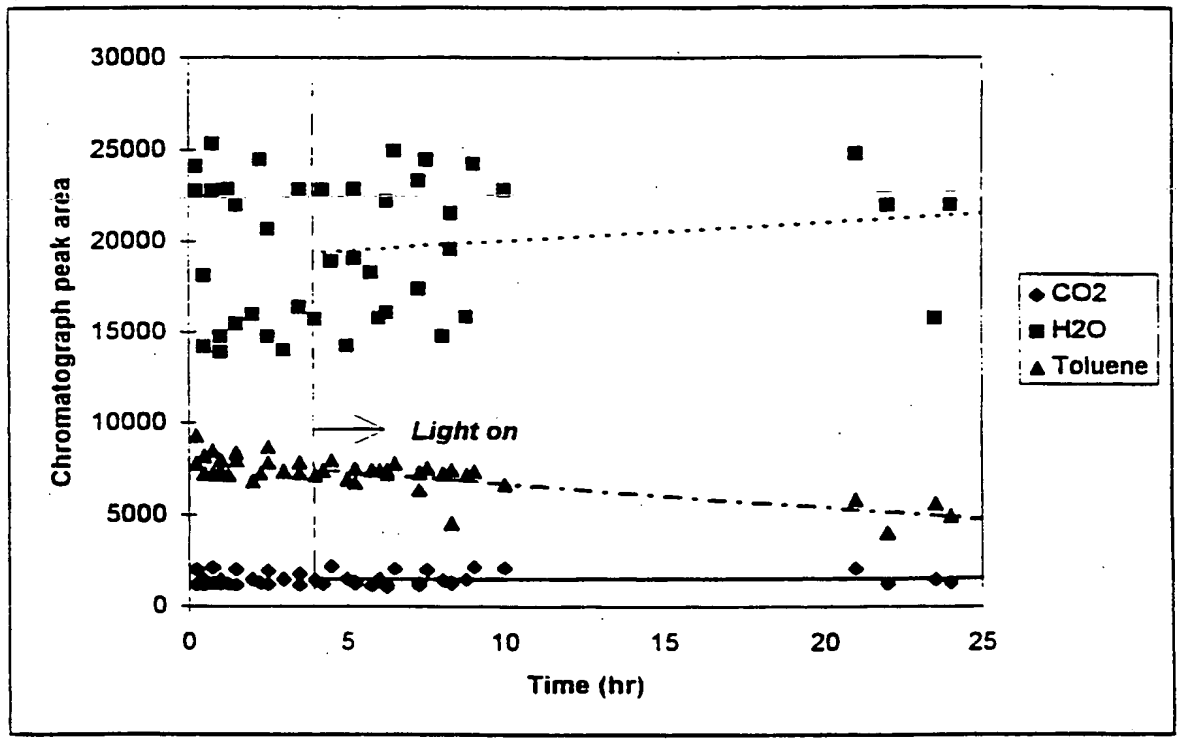

Figure 13B : **Experimental run with Photo-CREC-Air: initial toluene concentration=7.78 μg/cm^3, Temperature=100 °C, water level below 25 μg/cm^3.**

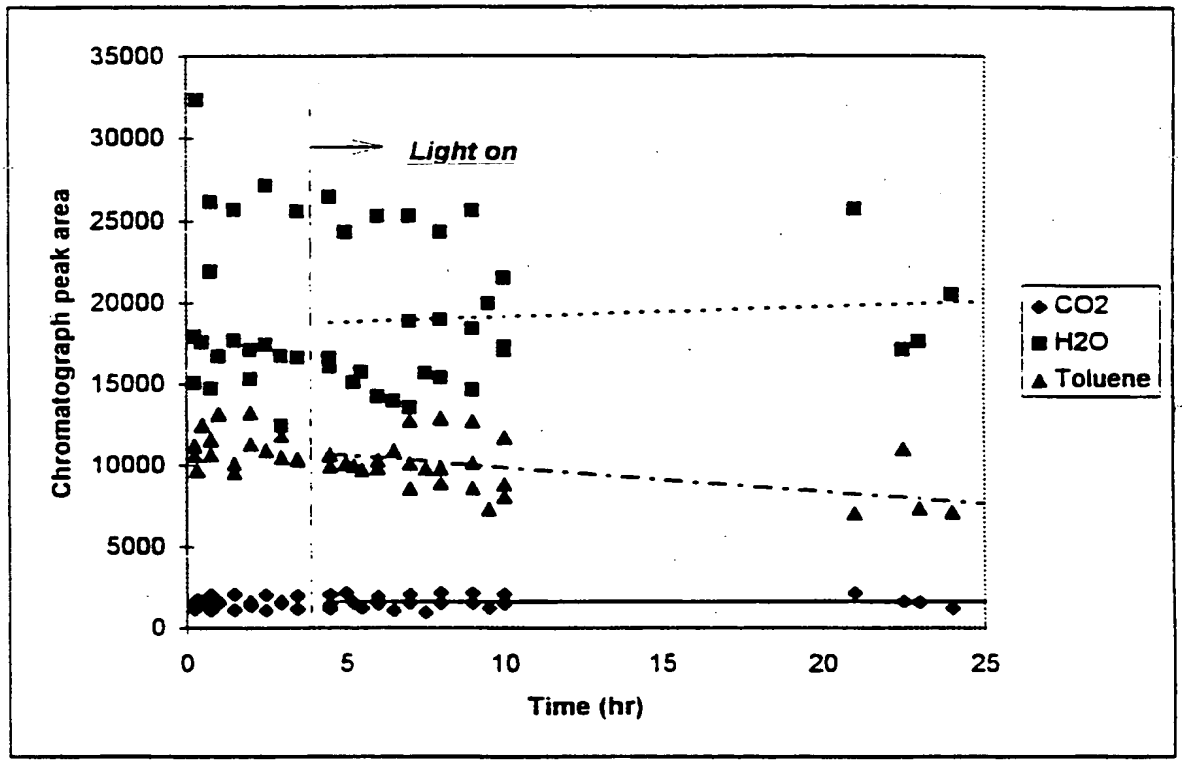

Figure 13B : **Experimental run with Photo-CREC-Air: initial toluene concentration=10.4 μg/cm^3, Temperature=100 °C, water level below 25 μg/cm^3.**

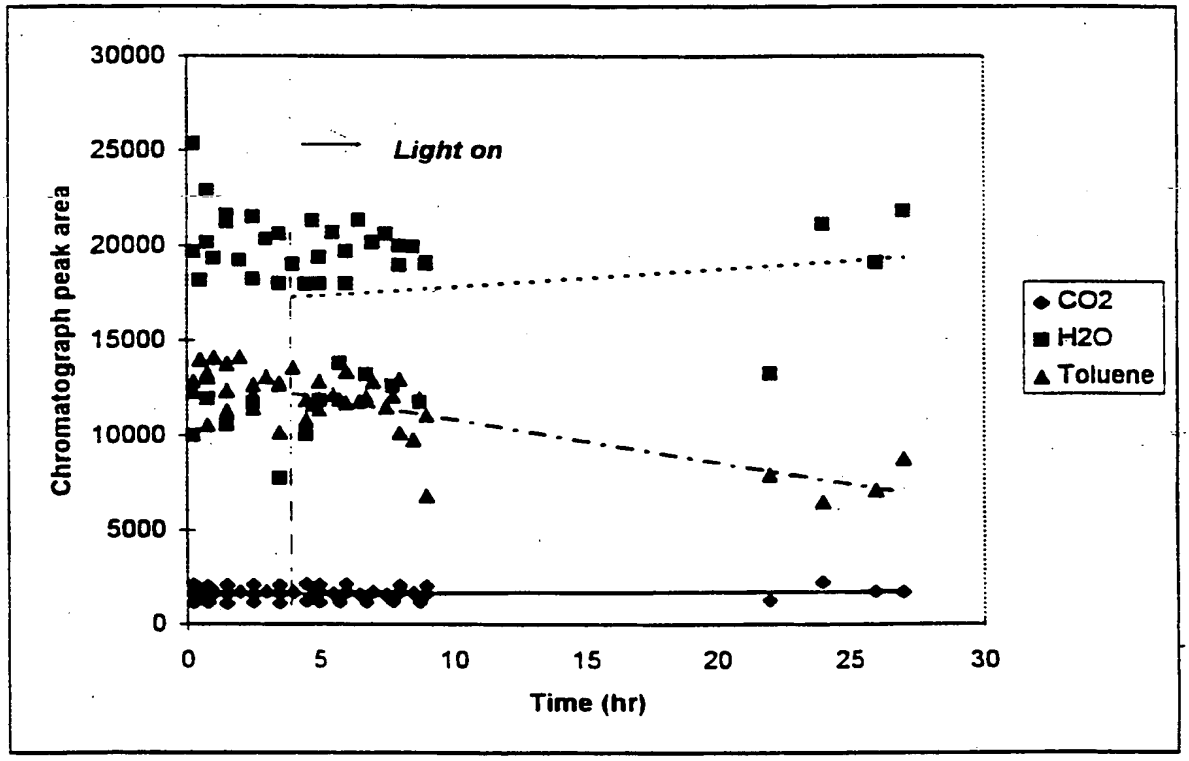

Figure 13D : **Experimental run with Photo-CREC-Air: initial toluene concentration=13 μg/cm^3, Temperature=100 °C, water level below 25 μg/cm^3.**

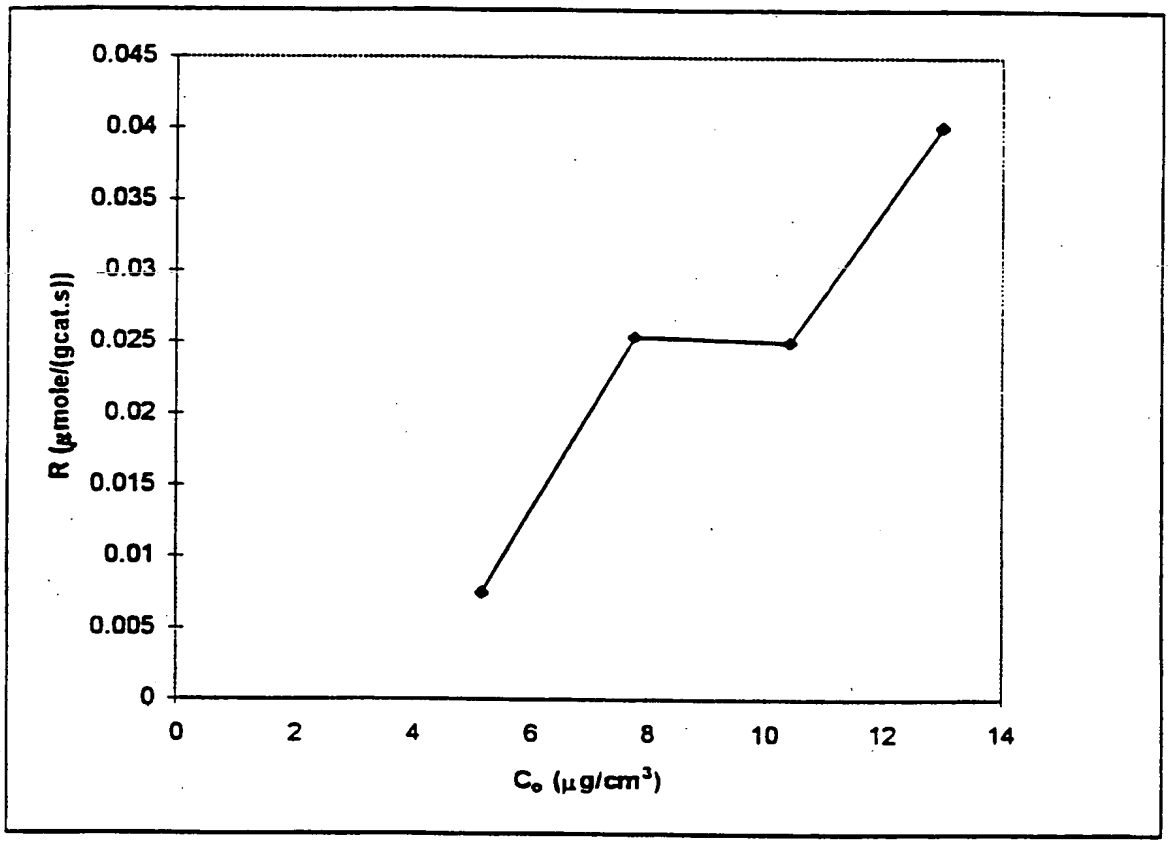

Figure 14 : **Rate of toluene oxidation as a function of the initial toluene concentration.**

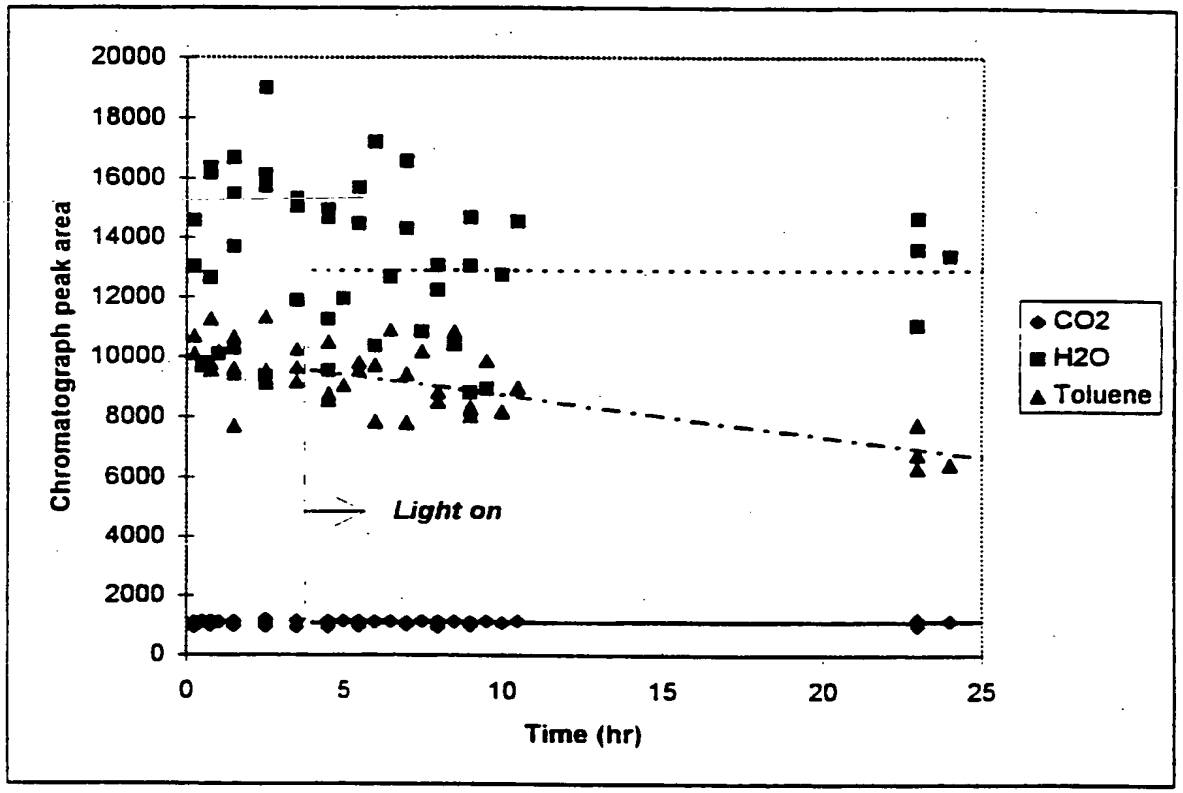

Figure 15A : **Experimental run with Photo-CREC-Air: initial toluene concentration=10.4 μg/cm^3, Temperature=75 °C, water level below 25 μg/cm^3.**

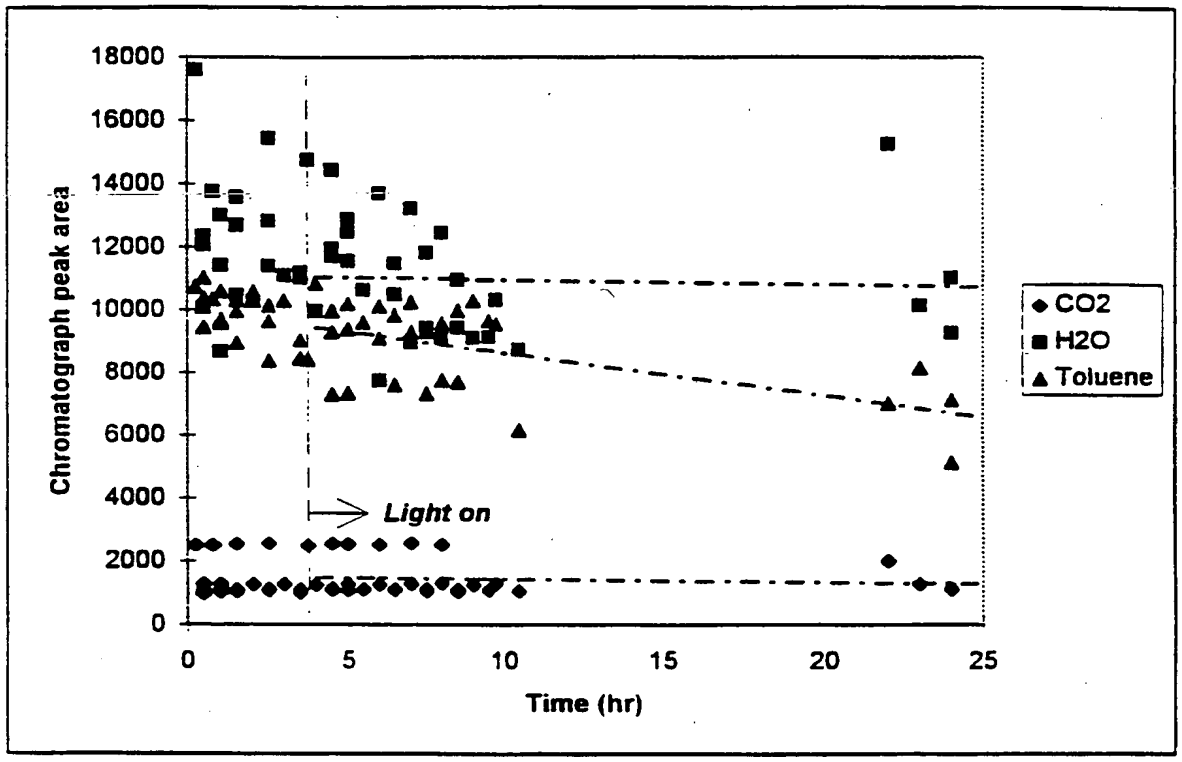

Figure 15B : **Experimental run with Photo-CREC-Air: initial toluene concentration=10.4 μg/cm^3, Temperature=50 °C, water level below 25 μg/cm^3.**

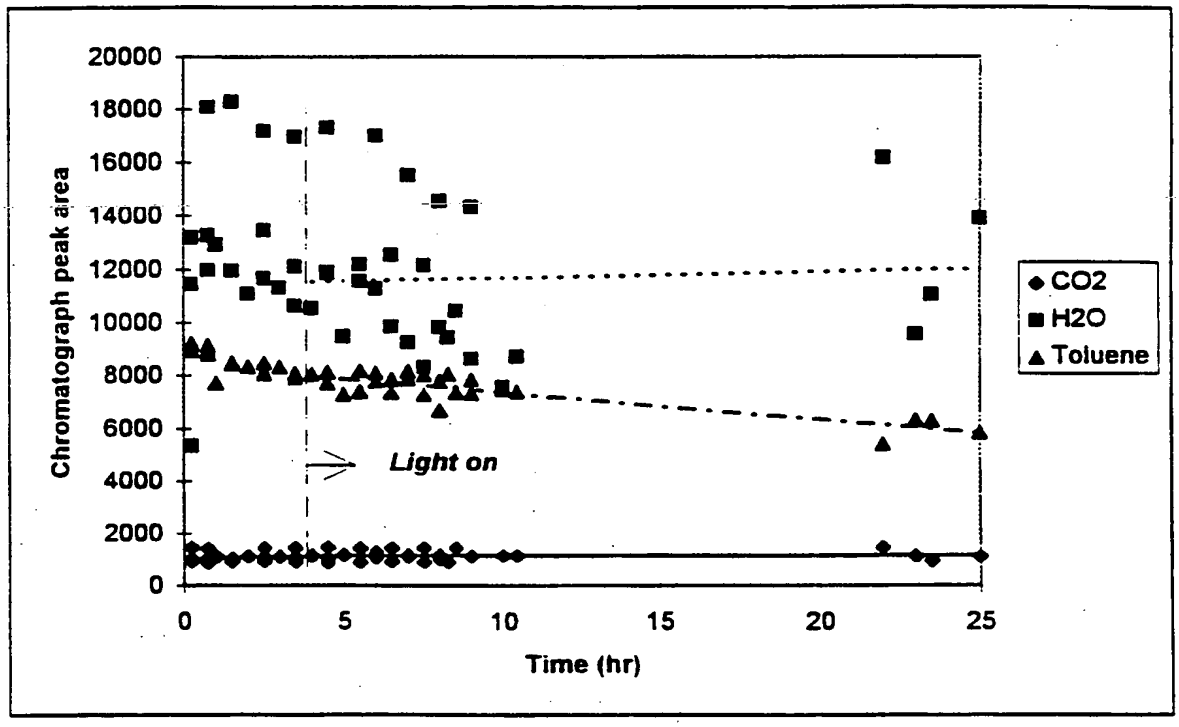

Figure 15C : **Experimental run with Photo-CREC-Air: initial toluene concentration=10.4 μg/cm^3, Temperature=20 °C, water level below 25 μg/cm^3.**

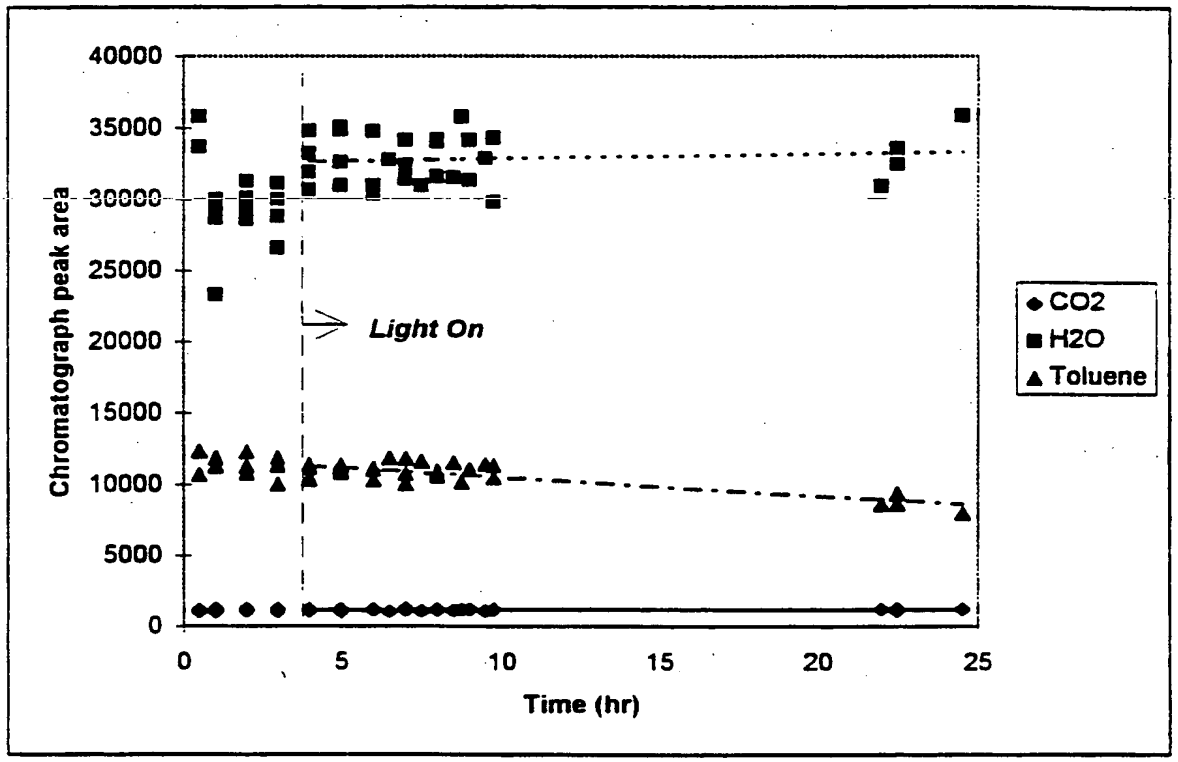

Figure 15D : **Experimental run with Photo-CREC-Air: initial toluene concentration=10.4 μg/cm^3, Temperature=100 °C, water level about 30 μg/cm^3.**

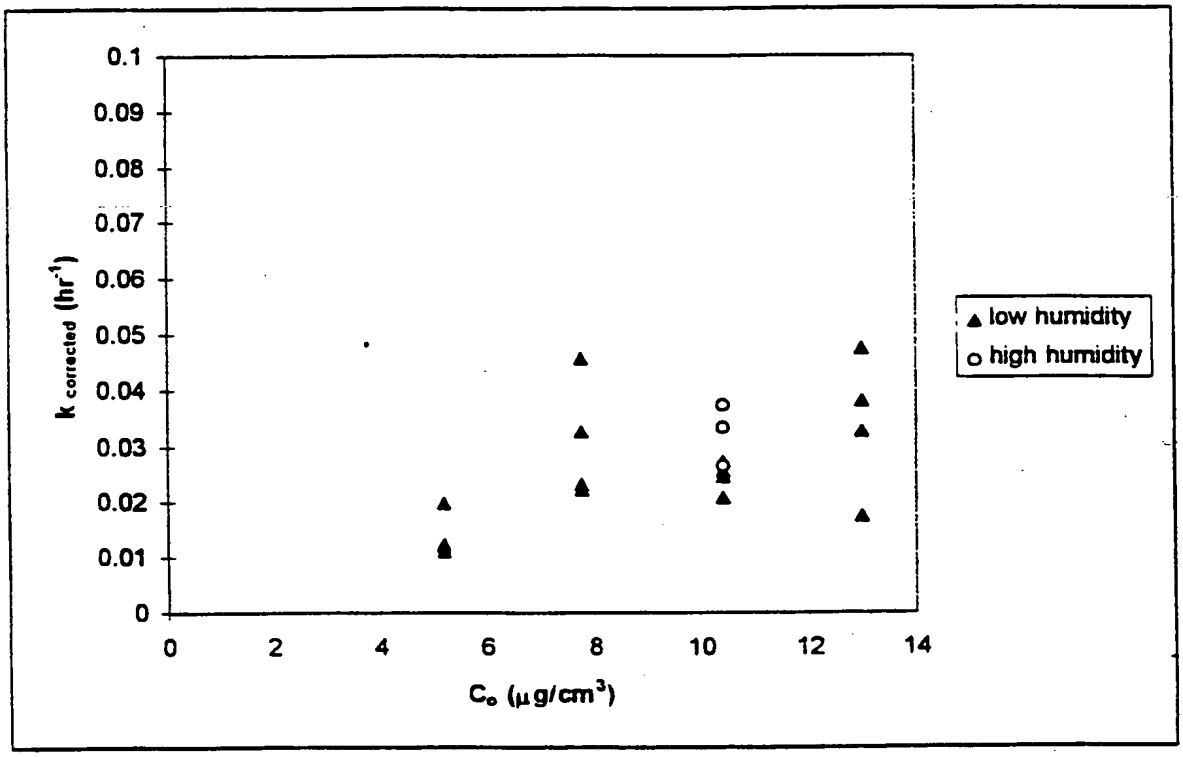

Figure 16A : **Kinetic constants for the different initial toluene concentration.**

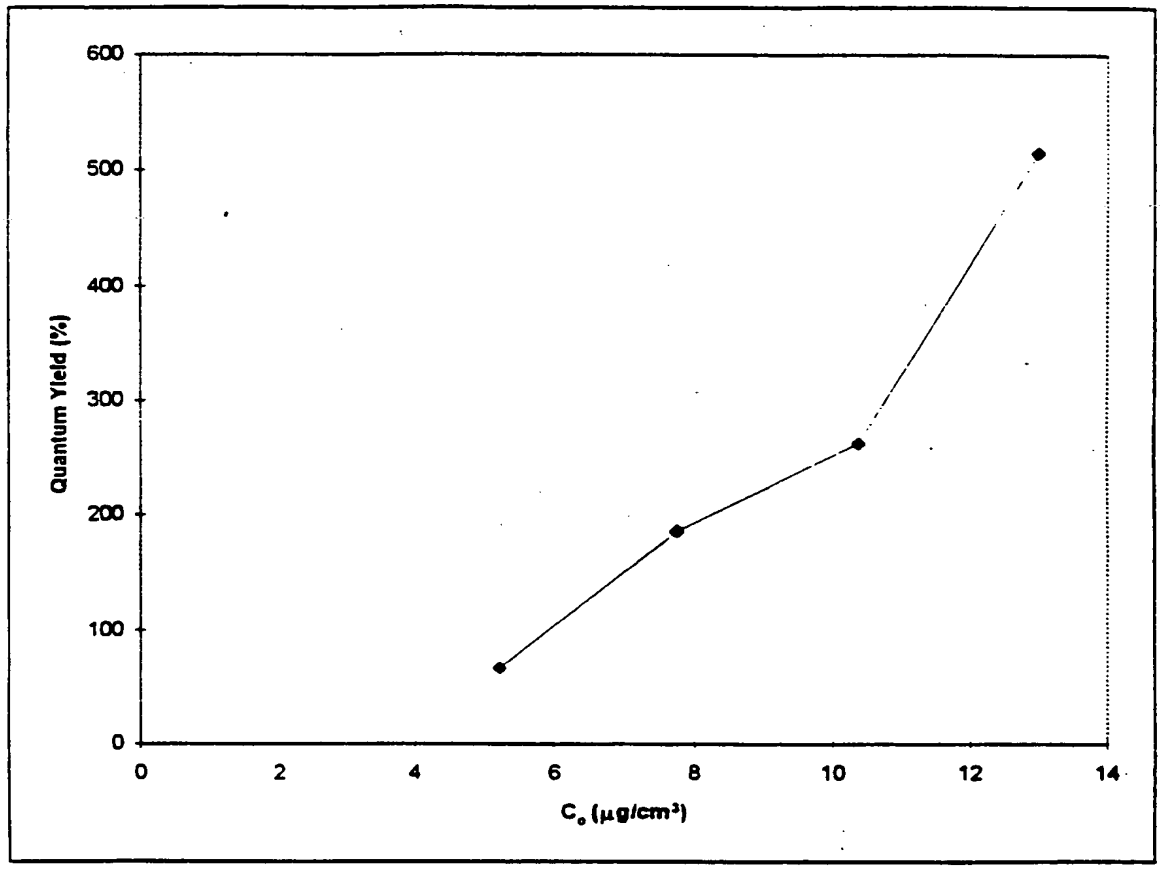

Figure 16B : **Quantum yields assessed for the different toluene initial concentrations studied.**

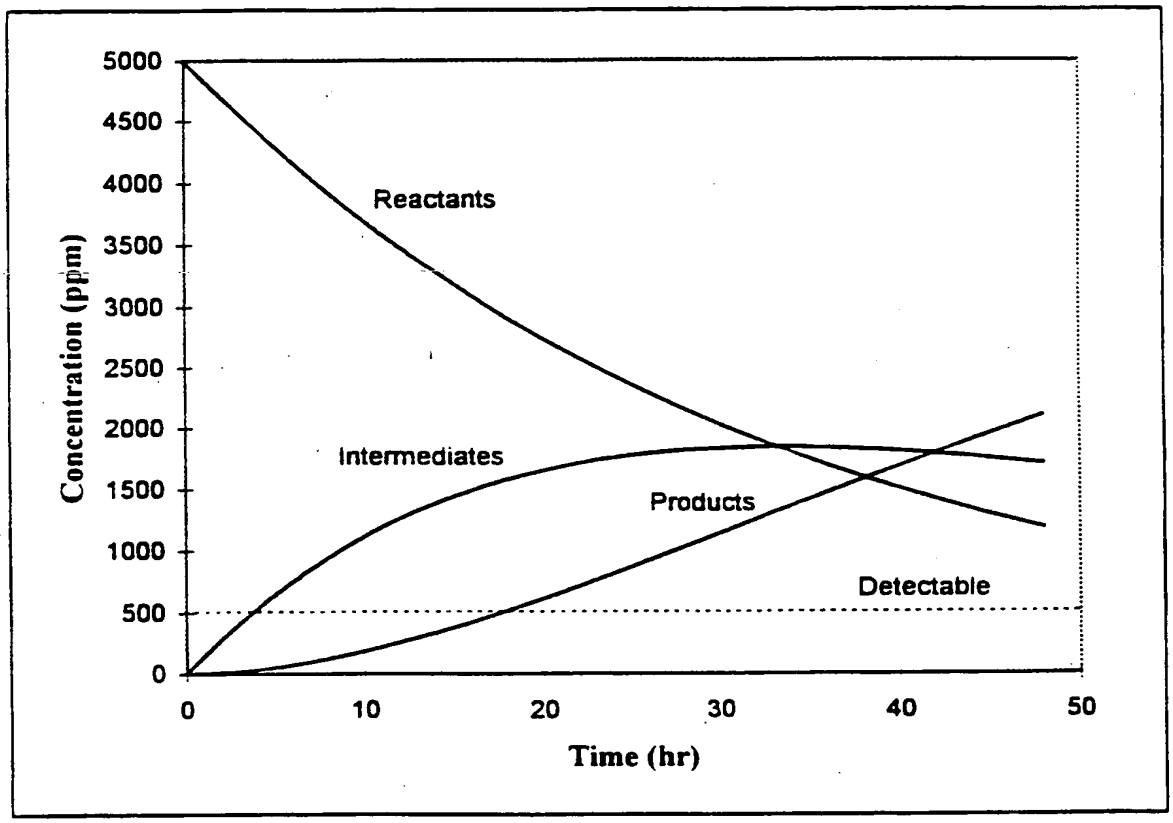

Figure 17A : **Simulated chemical species distribution for the following set of constants and operating conditions: k_1=0.03(hr^{-1}), k_2=0.03(hr^{-1}), and C_o=18 $\mu g/cm^3$ (5000ppm).**

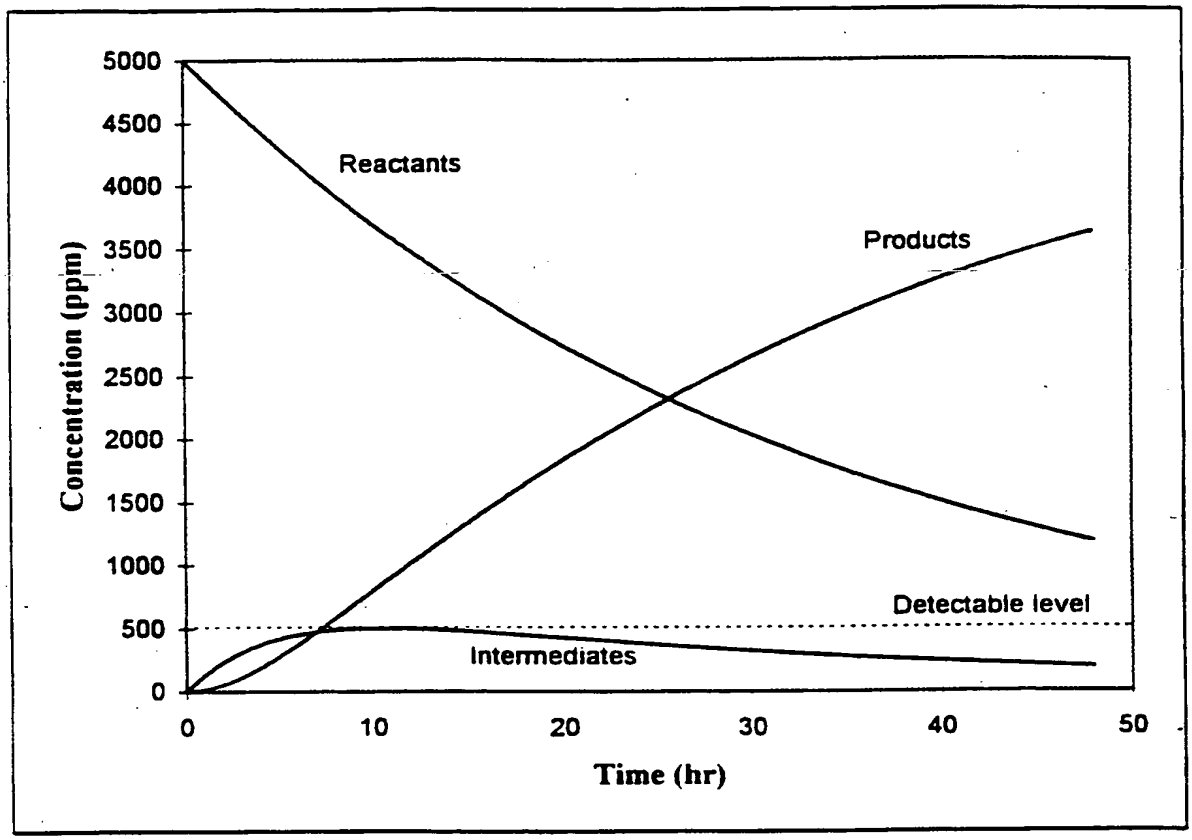

Figure 17B : **Simulated chemical species distribution for the following set of constants and operating conditions: k_1=0.03 (hr^{-1}), k_2=0.22 (hr^{-1}),and C_o= 18μg/cm^3(5000ppm).**

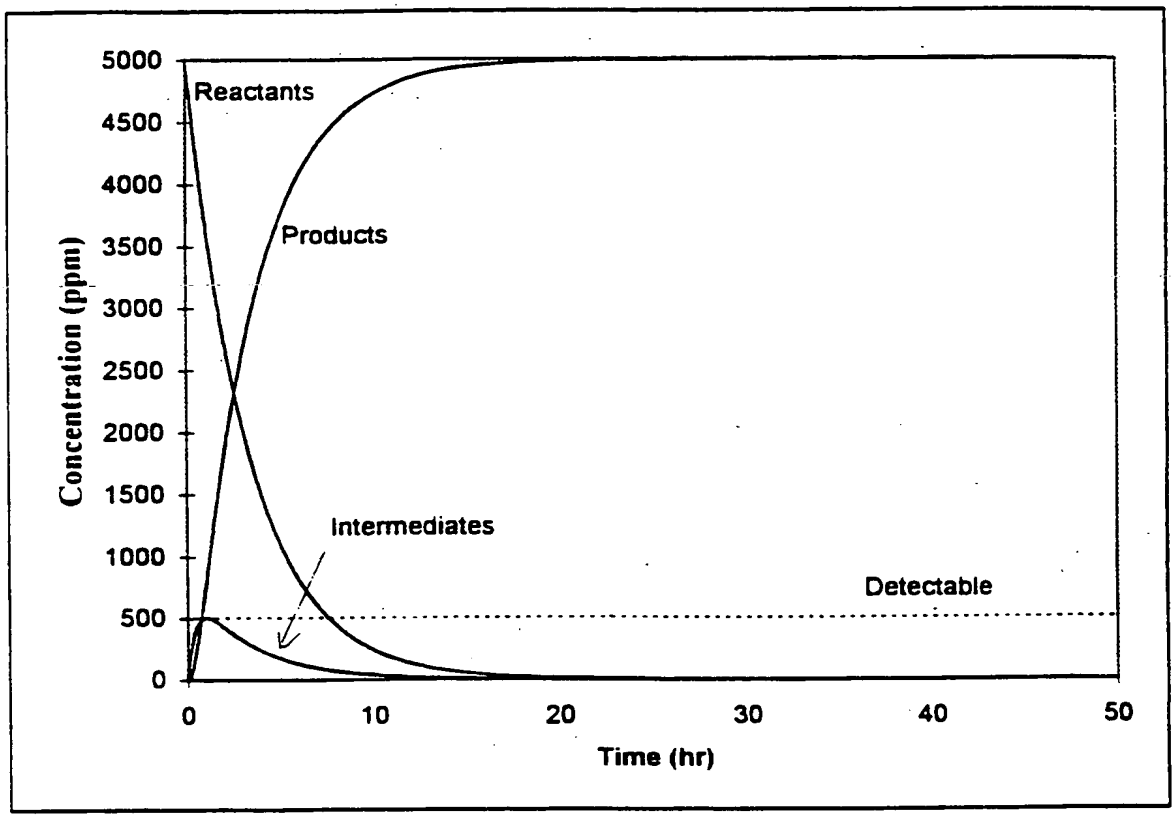

Figure 17C : **Simulated chemical species distribution for the following set of constants and operating conditions: k_1=0.3 (hr^{-1}), k_2=2.2 (hr^{-1}), and C_o= 18 $\mu g/cm^3$(5000ppm).**

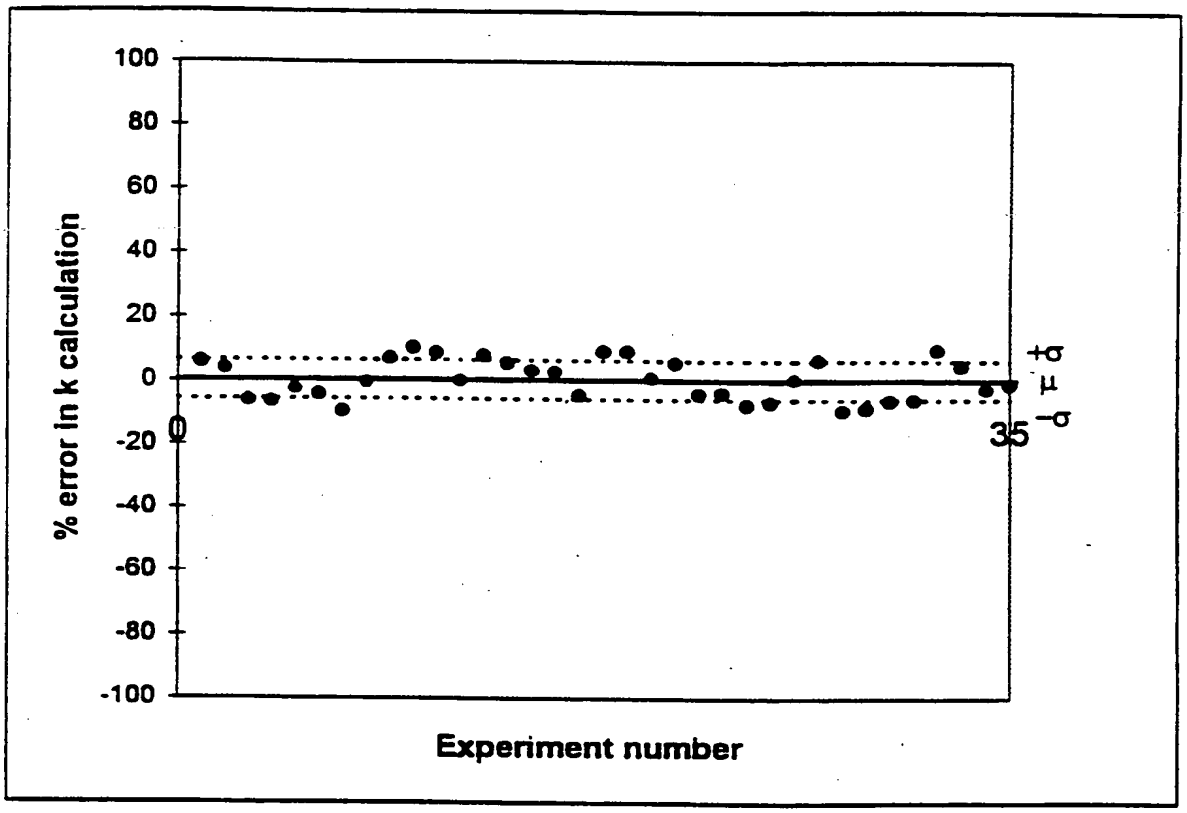

Figure 18 :Estimated errors of the kinetic parameter associated with the different measured variables